

Question 1: In the following questions, find the correct choice of the given choices. Circle your choices in the provided table (20 marks)

- 1. Which of the following can occur when there is redundant data stored in the database?
- a. It is impossible to uniquely identify a record.
 - b. Updates or changes can result in inconsistent data.
 - c. Linking tables cannot be created.
 - ☒ d. all of the above
2. A(n) _____ contains the changes that have been made to the database.
- a. rollback log
 - ☒ b. transaction log
 - c. server process
 - d. application server
- 3. Which of the following is normally used to generate a surrogate key in Oracle10g?
- ☒ a. sequences
 - b. key fields
 - c. candidate keys
 - d. the normalization process
4. Which of the following is *not* correct in regard to a primary key?
- a. A primary key cannot be NULL.
 - ☒ b. A primary key must appear as a foreign key in another table.
 - c. The value assigned to a primary key must be unique for each record.
 - d. None. All of the above are correct statements.
- 5. Which of the following can occur when there is redundant data stored in the database?
- a. It is impossible to uniquely identify a record.
 - b. Updates or changes can result in inconsistent data.
 - c. Linking tables cannot be created.
 - ☒ d. all of the above
- 6. Which of the following is normally used to generate a surrogate key in Oracle10g?
- ☒ a. sequences
 - b. key fields
 - c. candidate keys
 - d. the normalization process
7. Which of the following constraints permit NULL values?
- ☒ a. Unique
 - b. primary key
 - c. NOT NULL
 - d. none of the above
8. When you create an object, it is stored in your _____.
- a. user table
 - b. user schema
 - ☒ c. data dictionary
 - d. object list
9. Which of the following declares that the column can store a total of five digits, two of which are decimal values?
- a. NUMBER(3,2)
 - ☒ b. NUMBER(5,2)
 - c. NUMBER(float)
 - d. NUMBER(p, 2)

10. Which of the following constraints must be included or the table cannot be created in Oracle10g?
- a. primary key
 - b. foreign key
 - c. NOT NULL
 - ☒ d. none of the above
11. Which of the following commands should be used to change the name of a column?
- a. RENAME
 - ☒ b. ALTER TABLE
 - c. MODIFY TABLE
 - d. CHANGE
12. When modifying a database table, which of the following is a restricted action?
- a. deleting a constraint
 - b. increasing the maximum size value of a field
 - c. adding a new field
 - ☒ d. deleting a table
13. Which of the following commands is used to discard any uncommitted changes?
- ☒ a. ROLLBACK
 - b. COMMIT
 - c. DELETE
 - d. UNDO
14. Which of the following SQL commands cannot be rolled back after it is executed?
- ☒ a. TRUNCATE
 - b. DELETE
 - c. INSERT
 - d. UPDATE
15. Which of the following is a valid statement?
- a. You cannot truncate or drop a table that contains a constraint.
 - b. You cannot drop a table that contains a foreign key constraint.
 - c. You cannot drop a table that is being referenced by a foreign key constraint.
 - ☒ d. all of the above
16. Which of the following is a valid statement?
- a. The CREATE SEQUENCE command is a DML, so the user must execute a COMMIT command before the sequence is permanently updated to the database.
 - b. The CREATE SEQUENCE command is a DDL, so the user must execute a COMMIT command before the sequence is permanently updated to the database.
 - c. The CREATE SEQUENCE command is a DML, so the sequence is permanently updated to the database when the command is executed.
 - ☒ d. The CREATE SEQUENCE command is a DDL, so the sequence is permanently updated to the database when the command is executed.
17. Which keyword is used to retrieve the computer's current date and time?
- a. DATE
 - b. SYSTEMTIME
 - c. TIME
 - ☒ d. none of the above
18. A(n) _____ requires the use of a table alias to mimic the referencing of two different tables, when in reality, they are the same table.
- a. outer-join
 - b. inner-join
 - c. equi-join
 - ☒ d. self-join

19. You write a SELECT statement with two join conditions. What is the maximum number of tables you have joined together without generating a Cartesian product?

- a. 0
- b. 4
- c. 2
- ☒ d. 3

20. Could the two statements return different values?

Select count(s_id) From student; **And** Select count(*) From student;

- a. Always the same value returned
- b. First value > second value
- ☒ c. Second value > first value
- d. Always different values

M/C ANSWERS

1	a	<input checked="" type="radio"/> b	c	<input checked="" type="radio"/> d
2	a	<input checked="" type="radio"/> b	c	d
3	<input checked="" type="radio"/> a	b	c	d
4	<input checked="" type="radio"/> a	<input checked="" type="radio"/> b	c	d
5	a	<input checked="" type="radio"/> b	c	<input checked="" type="radio"/> d
6	<input checked="" type="radio"/> a	b	c	d
7	<input checked="" type="radio"/> a	b	c	d
8	a	<input checked="" type="radio"/> b	<input checked="" type="radio"/> c	d
9	a	<input checked="" type="radio"/> b	c	d
10	a	b	c	<input checked="" type="radio"/> d
11	a	<input checked="" type="radio"/> b	c	d
12	a	b	c	<input checked="" type="radio"/> d
13	<input checked="" type="radio"/> a	b	c	d
14	<input checked="" type="radio"/> a	b	c	d
15	a	b	<input checked="" type="radio"/> c	<input checked="" type="radio"/> d
16	a	b	c	<input checked="" type="radio"/> d
17	a	b	c	<input checked="" type="radio"/> d
18	a	b	c	<input checked="" type="radio"/> d
19	a	b	c	<input checked="" type="radio"/> d
20	a	b	<input checked="" type="radio"/> c	d

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Question 2:

Consider the following instances over the schema given below which represents a database of sailors, boats, and reservation activity of sailors reserving certain boats on certain dates. (5 marks)

Sailors(SID, SNAME, RATING, AGE)

Boats(BID, BNAME, COLOR)

RESERVES(SID, BID, DAY)

Sailors

SID	SNAME	RATING	AGE
22	Dustin	7	45.0
29	Brutus	1	33.0
31	Lubber	8	55.5
32	Andy	8	25.5
58	Rusty	10	35.0
64	Horatio	7	35.0
71	Zorba	10	16.0
74	Horashio	9	35.0
85	Art	3	25.5
95	Bob	3	63.5

Boats

BID	BNAME	COLOR
101	Interlake	BLU
102	Interlake	RED
103	Clipper	GRN
104	Marine	RED

Reserves

SID	BID	DAY
22	101	10/10/1998
22	102	10/10/1998
22	103	10/8/1998
22	104	10/7/1998
31	102	11/10/1998
31	103	11/6/1998
31	104	11/12/1998
64	101	9/5/1998
64	102	9/8/1998
74	103	9/8/1998

Suppose that the following SQL DDL commands were used to create the Sailors and Boats tables:

```
create table Sailors(
    sid          number(2),
    sname        varchar2(20) constraint sailors_sname_pk primary key,
    rating        number(2),
    age           number(4,1));
```

```
create table Boats(
    bid          number(3) constraint boat_bid_pk primary key,
    bname        varchar2(20),
    color        varchar2(20));
```

- Without re-creating the tables, write the required SQL statements so that **SID** becomes the primary key of the **Sailors** table. Give it a proper descriptive constraint name.

Handwritten solution:

~~ALTER TABLE Sailors DROP CONSTRAINT sailors_sname_pk;~~
~~ALTER TABLE Sailors ADD CONSTRAINT sailors_sid_pk primary key (sid);~~

- Add a new constraint on the column **COLOR** of the **Boats** table such that the possible values for this field are: **BLU** (for blue), **RED** (for red), **GRN** (for green), and **WHT** (for white). Give it an appropriate descriptive name.

Handwritten solution:

ALTER TABLE Boats ADD CONSTRAINT Boats_color_ch CHECK (color = 'BLU' OR color = 'RED' OR color = 'GRN');

3. Write SQL statement to create the **Reserves** table taking into consideration the PRIMARY and FOREIGN KEY constraints. Let DAY value be not null and it defaults to the system date at the time of record insertion.

```
CREATE TABLE Reserves(
  SID VARCHAR(2) constraint Reserves_SID-FK Foreign key (Sailor.SID),
  BID VARCHAR(3) constraint Reserves_BID-FK Foreign key (Boats.BID),
  Day Date Not Null Default = sysdate
  constraint Reserves_SID-BID-PK Primary key (SID,BID));
```

4. Add a new column to the table Reserves. Call it DURATION which records the expected time the sailor expects to reserves the boat for (the maximum time allowed for a boat reservation is 21 Days).

insert into Reserves values

```
ALTER TABLE ADD Column DURATION Date constraint
  constraint Reserves_duration-ch check DURATION <= system date + 21;
```

5. Create a view called RATING_AGE that displays the average age for each sailor rating.

RATING	AVG (AGE)
1	33
8	40.5
7	40
3	44.5
10	25.5
9	35

```
Create view as
(select Rating, AVG(AGE)
  From sailor
  Group by Rating);
```

Question 3:

Show the result of the following queries based on the instances of the tables given above.

(5 marks)

1. Query 1:

```
SELECT S.SNAME, S.SID
FROM SAILORS S, RESERVES R
WHERE S.SID = R.SID
GROUP BY S.SNAME, S.SID
HAVING COUNT(*) >= 3;
```

Dustin 22
Lubber 31

2. Query 2:

```
SELECT S.SNAME
FROM SAILORS S, RESERVES R, BOATS B
WHERE S.SID=R.SID AND R.BID=B.BID AND B.COLOR='RED'
MINUS
SELECT S2.SNAME
FROM SAILORS S2, BOATS B2, RESERVES R2
WHERE S2.SID=R2.SID AND R2.BID=B2.BID AND B2.COLOR='GREEN';
```

Horatio

3. Query 3:

```
SELECT S.SNAME
FROM SAILORS S
WHERE S.AGE > ( SELECT MAX(S2.AGE)
                  FROM SAILORS S2
                  WHERE S2.RATING = 10 );
```

Dustin
Lubber
Bob

4. Query 4:

```
SELECT SAILORS.SID, BID, DAY
FROM SAILORS, RESERVES
WHERE RESERVES.SID (+) = SAILORS.SID;
```

SID	BID	DAY	SID	BID	DAY
22	101	10/10/1998	22	102	10/10/1998
22	103	10/8/1998	22	104	10/7/1998
31	102	11/10/1998	31	103	11/6/1998
31	104	11/12/1998	64	101	9/15/1998
64	102	9/18/1998	71	103	9/18/1998
71					

5. Query 5:

```
SELECT S.SNAME
FROM SAILORS S
WHERE S.SID NOT IN ( SELECT R.SID
                      FROM RESERVES R
                      WHERE R.BID = 103);
```

Buntus
Andy
Rusty
Horatio
Zosba
Art
Bob

Question 4:

Consider the above **Sailors** table given in question2 and the following PL/SQL code:

(10 marks)

```

Declare
    v_sname          sailors.sname%TYPE;
    v_age            sailors.age%TYPE;
    v_rating          sailors.rating%TYPE;
    i                integer;

BEGIN

    SELECT sname, age, rating
    INTO v_sname, v_age, v_rating
    FROM sailors
    WHERE rating =9;

    DBMS_OUTPUT.PUT_LINE('<' || v_sname || '>');

    for i in 1..v_rating
    loop
        DBMS_OUTPUT.PUT_LINE(substr(v_sname,1,1));
    end loop;

end;
/

```

1. According to the ~~provided~~ data given above, what is the output of this PL/SQL code?

< Horashio >

2. What could go wrong if the code tries to get hold of all sailors with a rating ≥ 9 .

it's will return more than one row and implicit cursor must contain exactly one row.

3. Re-write the code so that you avoid the problems that might arise from running the code given below.

Declare

V_sname	Sailors. sname % Type;
V_age	Sailors. age % Type;
V_rating	Sailors. rating % Type;
i	integer

Cursor ~~SI~~ as

```
select sname, age, rating into sname, age, rating
from sailors where rating > 3.9;
```

Begin

Sl. Open ;
~~are not~~ ;

Fetch s1 into V-snam, V-age, V-rating;

if 51% Not Found Then Exit

End if

```
DBMS_Output.Put_Line('<' || V_Snam || '>');
```

for i in 1 to V-rating
loop

```
DBMS_Output.Put_Line ( substr (V_sname, 1, 1));
```

End loop

end; sl. close;

Question 5:

Write a PL/SQL block that displays for each sailor: SID, Name and a list of boat reservations. A sample output (that might be different from what you'll get) is shown below. (10 marks)

```
22 Dustin's Reservations:
> 101 on 10-OCT-98
> 102 on 10-OCT-98
> 103 on 06-OCT-98
> 104 on 07-OCT-98
29 Brutus's Reservations:
31 Lubber's Reservations:
> 102 on 10-NOV-98
> 103 on 06-NOV-98
> 104 on 12-NOV-98
32 Andy's Reservations:
58 Rusty's Reservations:
64 Horatio's Reservations:
> 101 on 05-SEP-98
> 102 on 08-SEP-98
71 Zorba's Reservations:
74 Horatio's Reservations:
> 103 on 08-SEP-98
85 Art's Reservations:
95 Bob's Reservations:
```

Declare

```
sr sailor %rowType;
rr reserves %rowType;
```

```
Cursor CS as
select * from sailor;
```

```
Cursor CR as
select * from reserves;
```

Begin

```
CS.open;
```

loop

```
Fetch CS into sr;
IF CS % Not Found THEN exit;
End if;
```

```
DBMS_output.put_line ( sr.SID || ' ' || sr.Sname || ' ' s Reservations);
```

```
CR.open;
```

```
Fetch CR into rr;
```

```
if CR % Not Found then exit;
```

```
Else if sr.SID = rr.SID
```

```
DBMS_output.put_line ( rr.BID || ' on ' || rr.Day);
```

```
End if;
```

```
End loop;
```

```
CR.close;
```

```
End loop;
```

```
End;
```

/